REMARKS

Claims 1 - 20 remain pending in the application. Claims 1 - 20 have been rejected by the Examiner under 35 USC §102. The Applicant respectfully traverses the rejection and requests reconsideration.

Rejection of Claims 1 –20 under 35 USC §102(b) – Dansky, et al.

Claims 1 –20 have been rejected under 35 USC §102(b) as being anticipated by Dansky, et al. (U.S. Patent No. 6,028,989). Dansky, et al. discloses a three-procedure method for identifying nets that need to be repaired because they have been determined to exceed allowable noise limits. The first procedure uses a known crosstalk computer program tool to generate crosstalk rules that are then used to generate a crosstalk report, which contains weights associated with each victim/perpetrator net combination. The weights are based on the spacing between the victim and perpetrator lines and other electrical and physical properties of the victim/perpetrator nets. The second procedure runs a program that uses the crosstalk report and seven other files to calculate noise voltages for each of the victim/perpetrator nets. The output of this program is the noise voltage associated with each victim/perpetrator net and a tabulation of the key physical and electrical parameters associated with each victim/perpetrator net. The third procedure runs a program that uses the output from the second procedure to determine which victim/perpetrator nets have noise voltages that exceed allowable noise voltage limits.

The complexity of the method disclosed in Dansky, et al. is readily apparent. In contrast, the present invention utilizes a relatively simple method to determine whether or not a potential noise problem even exists. Although the goals of Dansky, et al. and of the present invention are both to determine whether a noise problem exists, the manner in which this determination is made in accordance with the present invention is completely different from the approach disclosed in Dansky, et al. In fact, the present invention makes it possible to avoid many of the complex and time-consuming calculations performed in Dansky, et al.

In accordance with the present invention, it has been determined that it is not necessary to compute coupling capacitance in order to determine whether a potential noise problem exists. Rather, transition time of the victim signal alone can be used to make this determination, as recited in independent claims 1, 2, 10, 11 and 17 - 20. All of these claims recite the feature of comparing a signal transition time associated with a conductive metal line with a maximum signal transition time associated with the line and, if the signal transition time does not exceed the maximum signal transition time, concluding that a noise problem does not exist with respect to the line under consideration. With respect to the remaining subset of signal lines that may have potential noise problems, a procedure such as that disclosed in Dansky, et al., for example, could then be used to determine whether those lines in fact have noise problems associated with them. This would speed up the noise analysis performed in Dansky, et al. because a lesser number of lines would need to be fully analyzed for noise problems.

The Examiner refers to Col. 1, lines 55 – 62 of Dansky, et al. stating that this portion of text "cites a direct correlation between noise voltage calculations and transition time degradation for the coupling nets." Although the Applicant agrees that Dansky, et al. does indicate that noise voltage calculations are more accurate if transition time degradation is taken into account, the transition time degradation referred to in Dansky, et al. is the perpetrator time degradation and not the victim net time degradation. Furthermore, the present invention does not compute transition time degradation, but only transition time itself. In addition, the present invention evaluates transition times associated with the victim nets, and not the perpetrator nets.

The approach disclosed in Dansky, et al. uses many factors to calculate noise voltage, including coupling capacitance, coupled lengths, metal levels, etc. (See Col. 4, Table 1). In accordance with the present invention, it has been determined that it is unnecessary to calculate coupling capacitance in order to determine whether a potential noise problem exists (See p. 7, lines 13 – 16 of the present application). The third procedure disclosed in Dansky, et al. uses closed form equations to estimate voltage

noise levels on a victim net due to a transition on a perpetrator net. The set of parameters used in these equations includes mutual capacitance between two nets, self-capacitance of the victim net, self-inductance of the victim net, and wire resistance of the victim net plus output resistance of the victim driver.

The present invention enables these types of time-consuming computations to be avoided. Therefore, it is clear that Dansky, et al. does not determine that a potential noise problem does not exist based solely upon determining that the transition time of the victim net does not exceed a maximum transition time of the victim net. The independent claims of the present application have been amended to more clearly point out that a determination is made that a noise problem does not exist if a determination is made that the transition time associated with the line does not exceed the maximum transition time associated with the line. For all of these reasons, the Applicant respectfully submits that the claims of the present application are not anticipated by Dansky, et al., and respectfully requests that the rejection be withdrawn.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all pending claims are now in condition for allowance, and such action by the Examiner is earnestly solicited. Should there be any further questions or concerns, the Examiner is urged to telephone the undersigned to expedite prosecution.

Respectfully submitted,
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